

I. Spreadsheets and Components of Spreadsheets

- A. A **workbook** is a file which contains one or more spreadsheets
- B. A **spreadsheet** (or worksheet) is an arrangement of cells in columns and rows used to organize, analyze, calculate, and report information, usually in numerical form
 - For the remainder of this objective, the term *spreadsheet* will be used
- C. **Cells** are individual locations on a spreadsheet
 - 1. Cell A4 refers to one specific location
 - 2. Range A4:A16 refers to a group of adjacent cells
 - 3. Column A refers to all of the contents in a vertical range of cells in the first column of the spreadsheet
 - 4. Row 3 refers to all of the contents in a horizontal range of cells on Row 3
 - 5. 'All Years'!A6:E16 refers to a range of cells in a specific spreadsheet
- D. **Cell data** is classified according to its intended purpose
 - 1. The **label** classification is used for cells that contain text or for numbers that will not be used in calculations.
 - a. A social security number is an example of data that, although it consists of numbers, is treated as a label because its purpose is to identify, not calculate.
 - b. (Optional) Use an apostrophe before cell data that begins with numbers to indicate that the data should be treated as a label, for example: '456897890
 - 2. A **value** classification indicates that the data has the potential to be used in calculations.
 - a. Dates
 - b. Times
 - c. Percents
 - 3. A **formula** instructs the software to perform a calculation
 - a. Formulas begin with an equals sign (=). When the equals sign (or in some cases a plus sign (+)) is keyed in a cell, the software “knows” that the data will be used in a calculation.
 - b. Formulas use the following operators:
 - i. **Addition** – indicated by the + symbol and used in formulas to add cell values
 - ii. **Division** – indicated by the / symbol and used in formulas to divide cell values
 - iii. **Multiplication** – indicated by the * symbol and used in formulas to multiply cell values

- iv. **Subtraction** – indicated by the – symbol and used in formulas to subtract cell values
- c. Calculations are performed according to the **Order of Operations**
 - i. In the equation $= 5+2*3$, the result is 11 because the multiplication operation is performed first and then added to the number 5
 - ii. To change the order of operations, simply place parentheses around the part of the formula to be calculated first. Thus, in the equation $= (5 + 2) * 3$, the result is 21
- d. Formulas can be viewed and printed. In some software, the use of the CTRL +~ will change the spreadsheet mode to formula view

II. **Formatting** is applied to spreadsheet components for the purpose of organizing and clarifying information. Data that is presented in a uniform and consistent format is much easier to understand than data presented with random formats. Formatting can be applied to pages, columns, rows, cell ranges, and cells.

- A. A **header/footer** is a feature used to add identifying information to a spreadsheet. Information may include the title of the company, the date, the page number, time of creation or update, and contact information
- B. **Font Size and Style** options are used to clarify information by adding emphasis to titles, column headings, and grand totals, etc.
- C. **Justification** of cell data including titles (labels) and values (formulas, functions, dates, times, and numbers) is used to format cell data for the purpose of clarifying and organizing information.
 - Left, right, or center justification can be applied globally to columns or rows
 - The format painter can also be used to apply global formats
- 1. **Left** – by default, cells formatted as **labels** are left justified
- 2. **Indent** is a format applied to cell data to emphasize subcategories, such as the itemized list of expenses in a budget
- 3. **Right** – by default, cells formatted as **values** are right justified
 - a. Values should be formatted uniformly, such as using two decimal places for all like data or currency for total amounts
 - b. Values can be formatted for a set number of decimal places with or without a comma separator
 - c. Values can be formatted in a variety of date formats
 - d. Other formats include time, percentage, fraction, and scientific
- 4. **Center** – formatting usually applied to titles and column headings
- D. **Adjusting Height, Width, and Size of Cells, Columns, and Rows**

1. **Wrap** is applied to cells that require more space when the row or column size is adjusted
 2. **Merge** is used to combine adjacent cell ranges or cells
 - When merged, the default alignment is center
 3. **Column width** is adjusted to fit the longest entry
 - The #### symbols, when they appear in a cell, indicate that the width is too small to display the contents
- E. **Borders and Shading** are used to emphasize and organize information and can be applied to columns, rows, cell ranges, or individual cells
- F. **Editing**
1. Columns and rows can be inserted, copied, pasted, or deleted
 2. Cell data can be cleared, copied or pasted
 3. Columns, rows, and cells can be **merged** when space requirements are an issue
- G. **Renaming** a spreadsheet makes it more user-friendly by adding a descriptive identifier to the spreadsheet tab
- H. Changing the **order of spreadsheets** is helpful in organizing and clarifying information

III. Spreadsheet Operations and Functions increase the efficiency of data entry, the performing of calculations, and the presentation of information

- A. **Spreadsheet operations**
1. **Sort** is used to arrange data in alphabetical or chronological order
 - a. A **primary sort** indicates the primary sort range of data, such as sort by last name
 - b. A **secondary sort** indicates the next range, such as first name
 2. **Freeze panes** allows the user to work in multiple areas of a large spreadsheet and focus the view on specific cell ranges
 3. **Fill Series** is used to fill a column or row with consecutive data, such as the days of the week, months, and checkbook numbers
 4. **Print** is used to provide a hard copy
 - a. **Print preview** – used to validate how data is represented on paper before printing and to make adjustments to margins, gridlines, and page orientation, etc.
 - b. **Print a selection** – used when printing only a portion of a spreadsheet
 5. **Linking and embedding** is used to integrate spreadsheet data with other software applications
 - a. A word processing document (**target**) may contain a **link** to a spreadsheet (**source**) that will update anytime the spreadsheet data is edited

- b. An **embedded** spreadsheet is converted into a graphic image when placed in a **target** document and does not change to reflect edits made at the **source**
- B. **Spreadsheet functions** are predefined formulas that perform calculations by using specific values, called arguments, in a specific order. They can be used to perform simple or complex calculations.
- 1. **Components of a Function**
 - a. **Cell reference** – indicates a cell’s location and provides instructions for **how** cell data is copied or used in calculations
 - i. **Relative** (cell value changes as the formula is copied)
 - ii. **Absolute** (cell value remains static when copied to other locations)
 - iii. **Mixed** reference indicates the combination of an absolute cell and a relative cell, such as \$A4
 - b. **Parentheses** – control the Order of Operations
 - c. **Conditions or criteria** tell the function how to calculate the results and what data to use
 - 2. **Basic functions** include the following:
 - a. **Sum**, for example, =Sum(C4:C18) adds the range of cells from C4 through C18
 - b. **Average**, for example, =Average(C4:C18) determines the average of the range of cells from C4 through C18
 - c. **Maximum**, for example, =Max(C4:C18) finds the highest number in the range of cells from C4 through C18
 - d. **Minimum**, for example, =Min(C4:C18) finds the lowest number in the range of cells from C4 through C18
 - 3. **Advanced Functions** are used in higher-level operations, such as in conditional and comparison equations to compute interest rates, due dates and payment terms, and financial projections.
 - a. **IF statements** are conditional operators used in spreadsheet formulas
 - i. Results are returned IF the data specified in an equation meets conditions set by the formula
 - ii. IF statements can be written to carry out an action, such as: *IF a value in a cell is greater than or equal to another value, insert the word “Pass” in a cell*
 - b. **Date functions** are used to calculate a period of time such as the number of days that have elapsed since a value was entered into a specific cell or to calculate a 30 day due date for a record of spreadsheet of invoices.
 - i. The **NOW** date function returns the current date

- ii. **Days360** calculates the difference in days between two dates
- c. The **LookUp function** is used to compare a cell value to an array of cells and return a value that matches the location of the value in the array. Lookup is used for two column vectors or multi-column arrays.
 - i. Vector example: In the formula =Lookup(F9, G7:G12, H7:H12), the software is instructed to “look up” the value of Cell F9 in the cell range G7:G12 and return the value that is horizontally adjacent to it and located in the cell range H7:H12
So, if F9=5, G7=3, G8=7, and G9=9, the first “hit” will be to the value of 3
Array example: In the formula =Lookup(F9, G7:I12), the software will return the value that is in the last column (Column I) that matches the lookup value
 - ii. **VLookUp** is used when there are more than two columns in the array (lookup table). Vlookup searches for matches according to column number
For more information on the LookUp function, consult your software help files or reference books
- d. **List** is a feature used to create a more user-friendly spreadsheet atmosphere
 - i. A **validated** list limits data entry to specific choices programmed into the function
 - ii. A **non-validated** list allows additional entries other than those provided in the drop-down menu
- e. **Count** is used to return the number of cells in a range
 - i. The **Count** function alone will return the number of cells in a range that contain numbers
 - ii. The **CountA** function will return the number cells in a range that contain any value
 - iii. The **CountIf** function will count cells that meet a condition set forth in the formula